

D-21406

- 4 -

REMARKS

Claim 1 has been amended by incorporating the subject matter of claim 3 into claim 1. As such, claim 3 has been cancelled and therefore, claims 1, 2, and 4-10 are presently pending. Additionally, claims 4-8 have been amended to change their dependency from claim 3 to claim 1.

The Examiner rejected claims 3-8 under 35 U.S.C. §112, second paragraph as being indefinite. The Examiner stated that the claim language, namely, "that the dashpot is positioned on the tubing" is unclear. The Examiner would have the Applicant amend the claim to indicate that the dashpot is in fluid communication with the cryocooler fluid. This is not Applicant's invention. The dashpot, in fact, is positioned on the tubing to dampen any vibrations and is not necessarily in communication with the fluid within the tubing itself. As mentioned in Paragraph 17, dashpot 25 could be the connecting tubing, a bellows arrangement, a spring, a piston, a curved and/or flexible pipe. As mentioned with respect to Fig. 2, the mechanical vibrations could be better mitigated using one or more of the dashpot features, namely spring 91, mass 92 and/or piston 93. Hence, if solely a spring were used, the same would not be in fluid communication with the cryocooler fluid. However, if a flexible pipe were used for the connecting tubing, the same would be in fluid communication. Consequently, Applicant believes that claim 3 as presently drafted is clear and definite.

The Examiner indicated that claims 7 and 8 contained allowable subject matter and would be allowable if rewritten to overcome the rejections under 35 U.S.C. §112, second paragraph.

The Examiner rejected the claims, namely claims 1 and 9 under 35 U.S.C. §102(b) as being anticipated by Corey et al. Applicant submits, however, in view of the amendments to the claims in which a subject matter of claim 3 has been incorporated into claim 1, that this ground of rejection is hereby rendered moot. Furthermore, the Examiner's rejection of claims 2 and 10 under 35 U.S.C. §103(a) as being unpatentable over Corey et al. is likewise rendered moot in view of the amendments to the claims.

The Examiner rejected claims 3-6 under 35 U.S.C. §103(a) as being unpatentable over Corey et al. in view of Kawano. Claim 1, as amended calls for a dashpot to be positioned on the connecting tubing between a resonant linear motor and the cryocooler. Applicant submits that Kawano does not show the use of a dashpot and for such reason, amended claim 1 is patentable over such rejecting combination.

D-21406

- 5 -


As indicated in Kawano, col. 1, lines 10-33, a pulse tube refrigerator system is constructed such that a pressure wave generator, a regenerator, a cold head and a pulse tube are connected in series. When the pressure wave generator is turned on, an alternating mass flow of the working fluid is caused, which results in establishment of a phase difference between pressure oscillation and the working fluid. As indicated in column 1, lines 23-34, in order to obtain the maximum cooling ability or heat transfer, it is known that setting a phase difference of 90 degrees is effective.

Figure 3 of Kawano shows a conventional pulse tube refrigerator system in the prior art having a high temperature end 44 which is connected to an expansion piston system 6. This expansion system 6 has a space 63 that is generally referred to in the art as a compliance volume at the end of a restriction which helps match the phase difference. As further discussed in col. 2, first paragraph, a piston 62 located in space 63 is loaded by a spring 58 that is retarded by a wire coil in which a current is generated that dissipates heat to the surroundings. Thus, in the system shown in Figure 3, the compliance volume is connected to the pulse wave generator to recover some of the work produced by the pulse wave generator. This is not a damper that would serve to dampen vibrations. In fact, the motion of the piston 52 would, if anything, create more vibrations in the system. Hence, it is not believed that Kawano discloses the use of a dashpot.

Given that amended claim 1 is in allowable form, Applicant submits that claims 2, 4, and 5-10 should be allowable on the same basis.

In view of the remarks set forth above and the amendment to the claims, Applicant requests reconsideration of the rejection and the allowance of all presently pending claims. Since the claims are in condition for allowance, prompt and favorable action is hereby solicited.

Respectfully submitted,


David M. Rosenblum
Attorney for Applicant
Reg. No. 29,341

39 Old Ridgebury Road
Danbury, CT 06810
(203) 837-2116
September 27, 2006

Certificate of Transmission

I hereby certify that this correspondence is being facsimile transmitted to the United States Patent and Trademark Office, Fax No. 571-273-8300 on 9-27-06. (Date)

Typed or printed name of person signing this certificate.

Christina Mommeus
Signature: 